DOCUMENT RESUME

ED 277 726 TM 870 002

AUTHOR Handley, Herbert M.
TITLE Third Phase: Achievement Gains Associated with Implementation of the Assistant Teacher Program in the First Three Grades.
INSTITUTION Mississippi State Univ., Mississippi State. Bureau of Educational Research and Evaluation.
SPONS AGENCY Mississippi State Dept. of Education, Jackson.
PUB DATE Jul 86
NOTE 50p.; For a related document, see TM 870 003.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Academic Achievement; *Achievement Gains; Achievement Tests; Longitudinal Studies; Norm Referenced Tests; Primary Education; *Program Effectiveness; Program Evaluation; Scores; *Teacher Aides; Testing Problems; Test Results; Trend Analysis
IDENTIFIERS *Assistant Teacher Program MS; California Achievement Tests; California Test of Basic Skills; Stanford Achievement Tests

ABSTRACT

The effectiveness of Mississippi's Assistant Teacher Program (ATP) was evaluated after its third year of operation, determining: (1) whether first graders who were exposed to teachers and assistant teachers who had been in ATP for three years continued to make progress in academic achievement; (2) the effectiveness of ATP in fostering achievement among second graders who had been ATP participants for two years; and (3) the overall effect on third grade achievement of three years of ATP experience versus no exposure. The Stanford Achievement Tests (SAT) measured achievement in reading, mathematics, and language arts. Scores were compared with previous test results and with national norms. The SAT was administered to 42,579 first graders, 4,556 second graders, and 4,454 third graders. Results indicated a decline in first grade scores, perhaps due to the change in achievement tests used. First grade scores were above the national norms in reading and language, but below in mathematics. Second graders' achievement was similar to the previous year, and was above the fiftieth percentile in national norms. Achievement of third graders with three years of ATP experience exceeded nonparticipants' achievement. It was concluded that the program was highly successful. Further study of the first grade curriculum and test results was recommended. (GDC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED277726

THIRD PHASE: ACHIEVEMENT GAINS ASSOCIATED WITH IMPLEMENTATION OF THE ASSISTANT TEACHER PROGRAM IN THE FIRST THREE GRADES

By

Herbert M. Handley
Bureau of Educational Research and Evaluation
Mississippi State University
P.O. Box 5365
Mississippi State, MS 39762

for the
Mississippi State Department of Education
Jackson, MS

July 1986

TM 870 002

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

J. Barlow

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

In the spring of 1986, the third year of operation was completed for the Assistant Teacher Program (ATP) in Mississippi. The children in third grade classrooms throughout the state had been taught by teacher-assistant teacher teams for all three years of their school experience; second graders had been taught by these teams for two years and first grades had enjoyed the services of both professional teachers and assistant teachers for their first year in school.

At the end of the first two years of the study, respectively, it was discovered that groups of students participating in the Assistant Teacher Program scored significantly higher in the three areas of overall reading, mathematics and language arts than did groups at the same grade level who had not participated in the study. Further, it was discovered that during their first two years of schooling current third graders in the Assistant Teacher Program retained the levels of achievement throughout the two grades, whereas other students without the assistance of the teacher teams dropped in achievement between the first and second grades. To this point, achievement in mathematics was higher than that in reading for the children working in the ATP.

In process evaluations during the past two years, it was discovered that both administrators and teachers were highly supportive of the Assistant Teacher Program. Inservice programs to provide training for assistant teachers were viewed as successful by over two-thirds of the teachers participating in the study.

Through the end of the second grade, the effectiveness of the Assistant Teacher Program in promoting achievement was termed highly successful by external evaluators as the data were reviewed. Difficulties, however, were encountered in the evaluation since two different tests, the California Achievement Test and the California Test of Basic Skills, were used in program evaluation. This necessitated the use of conversion tables in doing longitudinal evaluation. Results showed that during the second year of the study the first graders placed at lower percentile ranks than did first graders of the previous year, even though both groups had studied under the teacher-assistant teacher teams. This lowering in percentile ranks was interpreted as being due to the use of more recent test norms, rather than actual decreases in achievement; i.e., the national norm group also improved in achievement while the Mississippi group improved.

Purpose of Study

Now that the Assistant Teacher Program has been operational for three years, the need exists to determine the overall effectiveness of the program. The purpose of the current study was threefold: (1) to determine whether first graders in learning experiences with teachers and assistant teachers who had worked in the program for three years continued to make progress in achievement; (2) to determine

the effectiveness of the Assistant Teacher Program in fostering achievement among second graders who had been in the program in both first and second grades and (3) to determine the overall effect of achievement of studying the Assistant Teacher Program for three years for third graders, as compared to third graders not receiving such assistance. As in the previous year of the evaluation, a new test battery was introduced for data collection. This Stanford Achievement Test, with norms established in 1982, was administered to students in the first three grades who participated in the study. The use of the new test was necessitated because of the need for using the Stanford Battery for evaluating the results of kindergarten programs which were also initiated for the first time in Mississippi during the last year. It was desirable to give only one standardized test last year in the primary grades.

Questions to be Answered

Within the limitations effected by changing tests, answers to the following questions were sought:

1. Did first graders in 1985-86 gain in achievement when their scores in reading and mathematics were compared with those of first graders in 1984-85?

2. What was the current status of first graders' achievement in reference to recently established national norms?

3. How well did first grade programs do in promoting achievement for upper level and lower level students?

4. How did achievement for second grade students in 1985-86 compare with achievement of second graders in 1984-85?

5. What was the current status of second graders in achievement in reference to recently established national norms?

6. How well did second grade programs in the stat work in promoting achievement for upper level and lower level students?

7. How did achievement for third grade students, having had the services of the Assistant Teacher Program for three years, compare with achievement of third graders in 1984-85 who did not have the benefit of the program?

8. What was the current achievement status of third graders?

9. How well did third graders do in relation to placement in the upper level and lower level achievement ranges?

Data Sources

At the end of the 1985-86 school year, Form E of Primary 1, Primary 2 and Primary 3 levels of the Stanford Achievement Test battery were respectively administered to children in the first three grades in Mississippi. All first graders in the state (n=42,579) took the test. Random samples of 4,556 second graders and 4,454 third graders also completed the test. The first and second graders who participated in the study were selected by a stratified random sampling method.

At each grade level it was decided that children in 200 classrooms would participate. To secure the sample for each grade, lists of teachers working at the specific grade level were secured and the name of one teacher was randomly selected within each school district. These names were removed from the overall grade list; then, an additional 46 teachers were randomly chosen from the state list as a whole. Randomization was secured by the use of a table of random numbers.

School districts were then notified of the names of teachers selected whose children would take the tests in the second and third grade. By this method, it was assumed that the sample of students taking the test would be representative of the state as a whole, but not necessarily of the school district. Functionally, at least one class of second and third graders, respectively, participated in the study in each district. Some districts, however, had two groups or more in each of the grade levels participating.

Data secured were supplied by the Psychological Corporation, publishers of the Stanford Achievement Test. Tapes reporting data for each child participating in the study were also analyzed at the district level.

Other data utilized in this study were that for first, second and third graders collected for the 1984-85 school year. Data reported for first and second graders for comparative purposes were collected through use of the California Test of Basil Skills (Form U), published by CTB/McGraw Hill. Third grade data were collected through use of the California

Achievement Test Battery (Form C, Level 13). In the longitudinal study, data for first graders during the first year of the study were collected by use of the California Achievement Test (Form C, Level 11).

Data Analysis

The use of three different tests during this evaluation period places rather severe limits on the validity of the evaluation design. Data were provided for converting scale scores of both the California Test of Basil Skills and the Stanford Achievement Test to the California Achievement Test equivalents, relative to 1977 norms. Such conversion, however, must be considered only as estimates of students relative progress. Gains are reported only in terms of percentile points, and these data should be viewed with caution. Percentile ranks were used to indicate relative achievement levels since that statistic is probably the most meaningful one for use across data from different standardized tests.

Finally, data describing students' progress in terms of more current national norms were also reported. These norm tables were provided by the publishers of the Stanford Achievement Test Battery which was normed in 1982.

Results of the Study

First Grade

Achievement Stability of First Graders

Achievement differences in the 1984-85 and 1985-86 first graders could be reported only in the achievement areas of total reading and total mathematics since these were the only tests for which conversion tables were provided for both tests used during the two years.

Did first graders in 1985-86 gain in achievement when their scores in reading and mathematics were compared with those of first graders during the previous year? Data on Table 1 show that the average first grader during the past year dropped in percentile rank relative to national norms in both areas of total reading achievement and total mathematics achievement. In equivalent California Percentile ranks, the average status of the first graders in the state dropped from the 66th percentile to the 63rd percentile, a decrease in three percentile points, in reading. The drop in mathematics achievement was even more dramatic. The 1984-85 group averaged at the 69th percentile in total mathematics, while the 1985-86 group averaged the 60th percentile.

The exact reason for this group was not altogether evident. The Stanford Test was new. That test also placed more emphasis upon the Concepts and Applications of Mathematics at the lower primary grades than did either the California Test of Basal Skills and the California Achievement Tests, the two tests used previously. Also, the Stanford Test

Table 1

Comparison of Achievement for 1985-86 First Graders in Mississippi with that of First Graders in 1984-85

Achievement Area	1984-85 N	1984-85 CTBS Scale Score	1984-85 CAT Equivalent Percentile	1985-86 N	1985-86 Stanford Scale Score	1985-86 Stanford National Percentile	1985-86 CAT Equivalent Percentile	Change Percentile
Word Study Skills/Phonic Analysis				42,572	514	51	50	
Word Reading				42,483	504	48		
Reading Comprehension				42,541	503	51	77	
Vocabulary				42,346	553	47	62	
Listening Comprehension				42,354	566	50		
Spelling				42,503	480	56		
Concepts of Numbers				42,579	520	44		
Math Computation and Application				42,468	521	39	59	
Environment				42,399	552	42		
Total Reading	36,334	467	66	42,225	508	50	63	-3
Total Listening				42,296	559	49		
Total Math	36,286	465	69	42,378	519	41	60	-9

was more recently normed than were the other two tests. The drop also may have been somewhat associated with errors encountered in the conversion of scores from one test to the other; but, particularly, a drop in nine percentile points in mathematics seems to be a large difference, even when the above variables are considered. Careful study of the curriculum in mathematics appears warranted at the first grade level, particularly since this subject has always been the strongest achievement area in Mississippi.

What is the current status of first graders' achievement in reference to recent established national norms? The average first grader in Mississippi scored lower on the Stanford Achievement Test battery in 1985-86 than have average first graders on other tests in recent years. As shown on Table 1, the first grade average was below national average (50th percentile) on six subtest scores. These areas in which lower scores were indicated were: word reading, vocabulary, concepts of numbers, environment, total listening and total mathematics. Following is a discussion of each achievement area and the first graders' status in each area.

Word Study Skills. The Word Study Skills subtest of the Stanford Battery is nearly equivalent to the phonic analysis test of the California Test of Basal Skills. The average first grader placed at the 51st percentile according to Stanford Norms and the 50th percentile in CAT equivalent norms on this subtest, indicating the average first grader placed on

or above national average in ability to identify compound words, contractions and other basic phonetic skills.

Word Reading. The word reading subtest of the Stanford Primary battery really had no direct equivalent on the CTBS or the CAT. This subtest measures students' ability to recognize words in print in which they should usually know the meaning. This skill is really basic to reading comprehension. The average first grader scored at the 48th percentile in this skill area, or two percentile points lower than the national average. In this skill area where the principles of phonic analysis are applied to the reading process, first graders in Mississippi need more work, if they are to score on or above the national average.

Reading Comprehension. The average first grader scored at the 51st percentile on the Stanford Test normed in 1986 in this critical area of understanding the meaning of simple sentences that are read. This rank was equivalent to the 77th percentile, as measured by the California Achievement Test used during the first year of the Assistant Teacher Program's evaluation. These data reflect very well on the first graders' ability to relate meaning to written passages. Last years' first graders averaged the 66th percentile on comprehension and first graders in 1983-84, the first year of the Assistant Teacher Program, averaged the 62 percentile. Student achievement in reading comprehension, then, for the 1985-86 school year is the best, ever, at the first grade level.

Vocabulary. The Stanford subscale in vocabulary is independent of pupils' ability to read. It measures primarily oral vocabulary and words are taken from the content areas of reading and literature; math, science, social studies and the arts and nonfiction and reference materials. This test really has no equivalent in either the CAT or CTBS. Both California tests, however, have a test called Reading Vocabulary.

The average first grader in the 1985-86 group placed at the 47th percentile on the Stanford Norms, showing that he/she ranked three percentile points lower than national average in the area of vocabulary. In CAT equivalents, however, the average first grader placed at the 62nd percentile in reference to reading vocabulary scores. These data show that students are still doing well in vocabulary at this grade level in reference to their achievement at the beginning of the program; but they need to work harder to keep up with recent growth in achievement in vocabulary by other first graders throughout the country.

Listening Comprehension. The ability of first graders to understand what they hear, as measured by the Listening Comprehension scale of the Stanford Test, has not been studied at the state level in Mississippi in recent years. As noted on Table 1, the average first grader scored at the 50th percentile or national average on this criteria. Since listening comprehension is a key skill area in predicting future achievement of students, this good ranking is welcome news.

Spelling. The average first grader placed at the 56th percentile in spelling achievement on the Stanford Test. This above average placement on national norms for the first graders as a whole has also been reflected on the CAT in previous years. Spelling is one of the strongest achievement areas for first graders in Mississippi.

Concepts of Numbers. The area of the Stanford Test measuring first graders' understanding of numerical concepts reflected relatively lower achievement in Mississippi. The average first grader placed only at the 44th percentile in the understanding of whole number systems, place values and an understanding of fractional parts. Since this particular area of achievement has not been previously studied as measured by a separate scale, first graders' achievement in concepts of numbers in 1985-86 cannot be compared with other years. These data reflect, however, that more work needs to be done in concepts of numbers at this level. Since numerical concepts at the first grade level are learned best on a concrete basis, these data may show that a need exists to do more concrete work on the meaning of numbers and their relationships, perhaps illustrated with hands-on experiential learning experiences.

Math Computation and Applications. The average first grader this year placed at the 39th percentile in math computation and applications. This is the lowest achievement level in mathematics recorded for first graders since the initiation of the Assistant Teacher Program. This percentile

placement is equivalent to the 59th percentile on the CAT, showing that students achieved well after the first year of the ATP, but they scored 11 percentile points lower than national average on a more currently normed test in this critical area. Decisively, more work needs to be done in mathematics at the first grade level, if Mississippi is to keep pace with national averages in achievement in math computation and applications.

Environment. Recent studies at Mississippi State University have shown that achievement of primary age children in environmental understandings, as measured by the Environment Scale of the Stanford battery, is highly correlated with these same children's later achievement in middle grades. As shown on Table 1, the average Mississippi first grader placed at the 42nd percentile level in achievement related to the understanding of surroundings. This percentile placement, approximately eight percentile points lower than national average, is critical for our first graders. Hopefully gains in this area of achievement will be indicated for first graders after the initiation of the kindergarten project. The types of experience encountered in school work at that level have been demonstrated to raise achievement in understanding environmental concepts.

Total Reading. On overall reading achievement, as measured by the Total Reading scale of the Stanford instruments, the average first grader placed at the 50th percentile on the Stanford Achievement Test. When the scale score for

the first grade average in total reading was converted to its CAT equivalent (63rd percentile), it was found that a drop in three percentile points was indicated for first graders since last year. This drop, however, may not be significant since error is expected in the conversion of scale scores to their equivalents on other instruments.

Total Listening. In total listening achievement, the average first grader placed at the 49th percentile on the Stanford, a position very close to the national average of 50th percentile. No data are available in this achievement area from previous years to use for comparative purposes.

Total Mathematics. Achievement profiles for the 1985-86 first graders in Mississippi placed the average first grader at the 41st percentile level according to Stanford Test norms. This achievement ranking for first graders, being nine percentile points lower than the national average, is critically lower than desirable and does not reflect well for future achievement of these students in the area of mathematics. This finding is particularly critical since mathematics has been the achievement area in which students have done so poorly at upper grade levels in Mississippi. The curriculum in Mathematics at the first grade level in Mississippi apparently needs considerable study. In the past first graders have scored high in mathematics (69th percentile on the CAT norms last year). Apparently the test in mathematics as assessed by use of the Stanford instruments are based on

objectives somewhat different from those built into the Mississippi curriculum at the first grade level.

How well did first grade programs do in promoting achievement for upper level and lower level students? An important facet of program evaluation is to determine how well both upper level and lower level students achieve under its aegis. Upper level students are generally considered to be those placing in the upper quarter or above the 75th percentile on national norms. These students are those needing enrichment in order to develop their academic potential to the maximum. Students scoring at the 25th percentile or lower (lower quarter) are generally considered to be the "at risk" group, so far as academics are concerned. An effective academic program should work to lower the number of students in this "at risk" status.

Upper Quarter Students. Data on Table 2 show that fewer than 25% of the first graders placed above the 75th percentile in all 10 areas of achievement for which such data were available. Further, for the four areas in which comparable data were available for 1984-85, significant drops of the percentage of students scoring in the upper quarter were indicated. The greatest drop was in the area of mathematics where only 17% of the first graders placed in the upper quarter in 1985-86, as contrasted to 32% of the first graders placing in the upper quarter during the previous year. This rapid drop in upper level achieving students within one year probably indicates a higher level of achievement expectation

Table 2

Percentage of First Graders Scoring in the Upper Quarter According to National Norms

Achievement Area	1984-85 %	1985-86 %	Change in Percentage
Word Study Skills	27	21	-6
Word Reading		18	
Reading Comprehension	22	20	-2
Vocabulary	26	18	-8
Listening Comprehension		19	
Spelling		23	
Concepts of Numbers		17	
Math Computation and Application		16	
Environment		16	
Total Math	32	17	-15

reflected in the Stanford Achievement Test, as compared to the California Test of Basal Skills, used for testing first graders the previous year. Drops for 8% of the first graders in vocabulary and 6% of the same groups in achievement related to word study skills are also somewhat significant, but the drop of three percent of the students from the upper quarter in reading comprehension may not be significant because of the different tests used for data collection.

In summary, the most evident achievement drop for upper level students was reflected in the area of mathematics. Further, a need for promoting higher achievement among upper level first grade students is evident in all areas tested.

Lower Quarter Students. The achievement record for lower level students in the first grade was better than that for the upper achieving students. As indicated on Table 3, fewer than 25% of the first graders placed in the lower quarter in the areas of word study skills, reading comprehension, and spelling. These data show that first graders in the ATP did better than expected in these three areas of achievement at the local level. Too many first graders, however, placed in the lower quarter in word reading (26%), vocabulary (30%), listening comprehension (27%), concepts of numbers (30%), math computation and applications (33%), environment (27%) and total mathematics (28%). These data show that, while as a whole, the first graders at the lower level are performing up to expectations more than are the upper level group, there is need for more work at the remedial level. It was encouraging

Table 3

Percentage of First Graders Scoring in the Lower Quarter According to National Norms

Achievement Area	1984-85 %	1985-86 %	Change in Percentage
Word Study Skills	27	22	-5
Word Reading		26	
Reading Comprehension	23	22	-1
Vocabulary	26	30	-4
Listening Comprehension		27	
Spelling		22	
Concepts of Numbers		30	
Math Computation and Application		33	
Environment		27	
Total Math	32	28	-4

however, to note that fewer children placed in the lower group this year in the areas of word study skills, reading comprehension, vocabulary and total math than last year.

In summary. It is quite evident from these data that first graders, in general, scored lower in achievement on the Stanford Test than did first graders in previous years. Much of this lowering in apparent achievement is probably related to the use of a new test. The Stanford Achievement Test, especially in the mathematical areas, appears to assess basal skills at a higher competency level than that assessed by either the California Achievement Test or the California Test of Basal Skills. At least first graders following the current curricula did not do as well as expected by previous performance levels. These data point out the need for a reassessment of first grade curricula, particularly in the area of mathematics, if these youngsters are expected to perform at the national average.

Second Grade

Achievement Stability of Second Grade

Achievement differences for second grade for the 1984-85 and 1985-86 academic years were computed in the areas of spelling, total reading and total mathematics since conversion table were available in these areas for determining the CAT equivalents for both the CTBS scores of 1984-85 and the Stanford scores of 1985-86.

How did achievement for second grade students in 1985-86 compare with achievement of second grades in 1984-85? Data in this study, as indicated on Table 4, show that, as a whole, achievement for second graders during the past year remained relatively the same as that of third grade counterparts a year ago. This year's group gained in total reading (3 percentile points) and total mathematics (one percentile point), but it lost comparatively in spelling achievement (two percentile points). These minor changes in achievement patterns were observed when the 1984-85 CTBS test data and 1985-86 Stanford Test data were converted to CAT equivalents, as shown on Table 4. Because of probable error involved in such conversion, for all practical purpose, it appeared that this past years' second graders, after two years of study with the Teacher-Teacher Assistants, did equally well as did last years' second graders who had studied under the same conditions. It was concluded, therefore, that the achievement level of second graders has reached a stable level of achievement in the Assistant Teacher Program.

What is the current status of second graders in achievement in reference to recently established national norms? As shown on Table 4, second graders, after two years of study in the Assistant Teacher Program, placed on the average above the national average of 50th percentile on all 14 areas of the achievement tested by the Stanford instrument. This result was viewed as a remarkable achievement for the Assistant Teacher Program.

Table 4

Comparison of Achievement for Second Graders in Mississippi
for the 1984-85 and 1985-86 School Year

Achievement Area	1984-85 N	CTBS Scale Score	CAT Equivalent Percentile	1985-86 N	Stanford Scale Score	Stanford National Percentile	CAT Equivalent Percentile	Change Percentile
Word Study Skills				4,556	587	56		
Word Reading				4,547	577	54		
Reading Comprehension				4,553	579	53		
Vocabulary				4,536	586	51		
Listening Comprehension				4,531	597	57		
Spelling	39,520	568	70	4,536	585	65	68	-2
Concepts of Numbers				4,550	567	60		
Math Computations				4,536	574	60		
Math Applications				4,540	560	52		
Environment				4,532	581	52		
Total Reading	39,529	578	57	4,540	580	53	60	+3
Total Listening				4,527	591	56		
Total Math	39,547	600	67	4,521	595	58	68	+1

The average second grader placed highest in spelling achievement (65th percentile) and lowest in vocabulary (51st percentile). Average achievement for the group in both concepts of numbers and math computations ranked at the 60th percentile, while average achievement in math applications ranked at the 52nd percentile. Achievement in overall mathematics for the average second grader ranked at the 58th percentile on Stanford norms. These data show that the lower rankings in mathematics achievement indicated for this year's first graders were not evident in the second grade. Indications are that two years of study in the ATP are sufficient for developing the mathematical concepts measured by the primary battery of the Stanford tests in mathematics. The relatively high achievement levels of the average second grader in listening comprehension (57th percentile) and reading comprehension (53th percentile) were also welcome observations since these skill areas are so closely associated to the critical thinking of students in later years.

How well did second grade Assistant Teacher Programs in the state work in promoting achievement for upper level and lower level students? Data on Table 5 show that second graders in the state are doing better by placing more students in the upper quarter of achievement than expected according to national norms. In the areas of spelling and math computations, for example, 33% of the first graders placed above the 75th percentile in achievement. According to national norms, only 25% would be expected to place at this upper level. In

Table 5

Percentage of Second Graders Scoring in
Upper Quarter According to National Norms

Achievement Area	1984-85 %	1985-86 %	Change in Percentage
Word Study Skills	20	23	+3
Word Reading		28	
Reading Comprehension	26	25	-1
Vocabulary	18	18	0
Listening Comprehension		27	
Spelling	32	33	+1
Concepts of Numbers		27	
Math Computation	43	33	-10
Math Applications	25	24	-1
Environment		21	

the areas of concepts of numbers and listening comprehension, 27% of the second graders ranked in the upper fourth of the national group. Twenty-eight percent of the second graders placed in the upper quarter in word reading and 25% of the group placed above the 75th percentile (the exact level expected) in reading comprehension. Areas of achievement in which more students need to move into the upper quarter are word study skills (vocabulary), math applications and environment.

The only two achievement areas in which the relative status of high level students changed from 1984-85 to 1985-86 were math computations where 10% fewer second graders placed in the upper quarter in the past year and word study skills, where three percent more students placed in the upper quarter than in previous years.

Lower Quarter. The achievement of lower level students at the second grade level appeared to be especially commendable. As given on Table 6, fewer than 25% of the second graders (the expected level) placed in the "at risk" category of the lower quarter in achievement in all areas for which data were available. As compared to the previous year, 12% of the second graders of 1985-86 placed in this risk category in the area of word study skills; seven percent fewer in both areas of reading comprehension and vocabulary placed in the lower quarter and six percent fewer second graders placed in this lower group in achievement associated with math applications. Four percent fewer of the second graders scored in

Table 6

Percentage of Second Graders Scoring in the Lower Quarter According to National Norms

Achievement Area	1984-85 %	1985-86 %	Change in Percentage
Word Study Skills	30	18	-12
Word Reading		23	
Reading Comprehension	24	17	-7
Vocabulary	25	21	-4
Listening Comprehension		17	
Spelling	21	14	-7
Concepts of Numbers		16	
Math Computation	17	14	+2
Math Applications	28	22	-6
Environment		20	

the lower quarter in vocabulary. In math computations, the only achievement area where more students placed in the lower group last year, only two percent more of the second graders placed in the "at risk" group.

In Summary. Second graders, as a whole, under the Assistant Teacher Program, placed above the national average in all areas tested by the Stanford Achievement Test battery. The areas of higher achievement were spelling, concepts of numbers and math computations. The achievement pattern of second graders who have studied for two years under the teacher-teacher assistant teams appears relatively stable, as inferred from the very little differences in achievement patterns observed for second graders in two consecutive years. Further work needs to be done to help both lower level and higher level achieving groups to reach their maximum academic potential in the skill areas. These data show very positive continued effects of the Assistant Teacher Program in promoting achievement in second graders.

Third Grade

Achievement results of the 1985-86 third graders in Mississippi are the best indicators of the overall effectiveness of the Assistant Teacher Program observed thus far. These students have been taught in classrooms with the services of teacher-assistant teacher teams for all three of their school years. They have also reached a stage of development where they can respond to tests; hence, the results should be much more valid.

How well do third grade students perform academically, having had the services of the Assistant Teacher Program for three years, compare with achievement of third graders who did not have the benefit of the program? Test results for the 1985-86 third graders in Mississippi as measured by the Stanford Achievement Test battery were compared with those for the 1984-85 third graders who had not been in Assistant Teacher Programs. Since the test data for the 1984-85 group were collected through use of the California Achievement Test Battery, it was necessary to convert the Stanford scale scores to their CAT equivalents. Then, scores for both groups were expressed in percentile ranks according to national norms. Such comparisons were made for eight of the achievement areas since equivalent data were available.

As given on Table 7, the third graders having the benefits of the Assistant Teacher Program scored higher on all eight measures of achievement than did their counterparts who did not have assistant teachers. In reading comprehension, the ATP third graders scored 29 percentile points higher than did the non-ATP group of third graders. In Total Mathematics, the ATP group scored 22 percentile points higher than did the non-ATP group; the ATP group scored ten percentile points higher in total reading and 19 percentile points higher in total language than did the non-ATP group.

These data show that current third graders are much better prepared in all achievement areas measured by the tests than their counterparts of a year ago.

Table 7

Comparison of Achievement for Third Graders in Mississippi
Before and After Implementation of the Assistant Teacher Program

Achievement Area	Third Grade (1984-85) N	CAT Scale Score	CAT National Percentile	Third Grade 1985-86 N	Stanford Scale Score	CAT Equivalent Percentile	Changes in CAT Equivalent Percentile Points
Reading Vocabulary	8,909	366	43	4,438	612	57	+14
Reading Comprehension	8,902	394	45	4,447	613	74	+29
Total Reading	8,884	373	46	4,540	608	56	+10
Spelling	8,903	437	51	4,536	585	55	+4
Math Computations	8,842	376	50	4,444	614	72	+28
Math Applications	8,862	405	48	4,446	593	76	+28
Total Mathematics	8,839	372	43	4,428	602	65	+22
Total Language	8,902	448	53	4,435	628	72	+19

What is the current status of third graders in achievement relative to national norms? Data of Table 8 show that third graders, after studying in ATP classroom for three years placed above the 50th percentile (national average) on all areas of achievement tested as determined by Stanford Test norms. Highest achievement was recorded in the area of spelling, where the average third grader placed at the 65th percentile. The group averaged the 57th percentile in total language achievement and at the 59th percentile in both using information and language. The group placed at the 57th percentile in total mathematics achievement and at the 56th percentile in achievement in concepts of numbers. The group average was at the 54th percentile in achievement in math applications, social science, vocabulary and reading comprehension, and at the 53rd percentile in total listening and science. The ATP third graders, on the average, placed at the 52nd percentile in listening comprehension and at the 51st percentile in total listening. The lowest area of achievement recorded by the third grade group was in word study skills, where the group average was the 50th percentile, national average.

These data show that the 1985-86 third graders averaged on or above national average (50th percentile) on all criteria tested by the Stanford Achievement Test. This test was a new one for the state as a whole; hence possibilities of test over-familiarity were lessened in these data.

Table 8

Current Achievement Status of Mississippi
Third Graders According to National Norms

	N	Stanford Scale Scores	Stanford National Percentile
Word Study Skills	4,451	606	50
Reading Comprehension	4,447	613	54
Vocabulary	4,438	612	54
Listening Comprehension	4,439	621	52
Spelling	4,442	632	65
Language	4,450	630	59
Concepts of Numbers	4,454	602	56
Math Computation	4,444	614	55
Math Applications	4,446	593	54
Social Science	4,431	604	54
Science	4,442	611	53
Using Information	4,394	621	59
Total Reading	4,440	608	51
Total Listening	4,433	617	53
Total Language	4,435	628	60
Total Mathematics	4,428	602	57

How well did third grade programs in the state do in promoting achievement for upper level and lower level students? Data showing the percentage of upper level and lower level students in the 1985-86 academic year are shown on Table 9 and 10, respectively.

Upper Level Students. As shown on Table 9, the number of expected students (25% or more) in the upper quartile of achievement were observed in the areas of reading comprehension (25%), spelling (33%), language (25%), social sciences (25%) and science (27%). These data show that the third grade teaching teams are providing programs which meet the academic needs of advanced students in these specific areas.

Lower performance areas for the upper level students were word study skills where only 16% of the state's third graders placed in the upper quarter, listening comprehension where 20% of the group placed above the 75th percentile and concepts of numbers and math computations where, in both areas, 22% of the third graders placed in the upper quarter. These data show that more work needs to be done in mathematics and listening comprehension, as well as word study skills, to challenge more of the potential upper-achieving students to place at their expected achievement levels.

On Table 9, it was also shown that more third grade students placed in the upper quarter in 1985-86 than previously in the areas of word study skills, reading comprehension, vocabulary, spelling, language, math computations and math applications. This improvement was commendable.

Table 9

Percentage of Third Graders in
Upper Quarter in Achievement

Achievement Areas	Percentage 1984-85	Percentage 1985-86	Changes in Percentages
Word Study Skills	13	16	+3
Reading Comprehension	16	25	+9
Vocabulary	18	23	+5
Listening Comprehension		20	
Spelling	19	33	+14
Language	20	25	+5
Concepts of Numbers		22	
Math Computation	21	22	+1
Math Applications	22	24	+2
Social Science		25	
Science		27	

Lower Level Students. Data on Table 10 show that fewer third graders placed in the lower quarter, or "at risk" area, in Mississippi than would be expected according to national norms. These data indicate that primary grade programs, under the aegis of the teacher-assistant teacher teams, are functioning very well in moving students out of the lower quarter into the average range for achievement. Areas where more of the third graders are still "at risk" are math applications (20%), word study skills (20%), vocabulary (21%), social sciences (18%) and science (18%).

In the area of reading comprehension, it was noteworthy that 16% fewer third graders of the 1985-86 third grade group were in the "at risk" category in reading comprehension than were from the 1984-85 group of third graders who had not studied under the Assistant Teachers. Ten percent fewer of the ATP group also scored in the lower quarter in the area of vocabulary than did their peers not studying with teacher-assistant teacher teams. In mathematics, four percent and seven percent fewer third graders placed in the lower 25th percentile in the respective areas of math computations and math applications.

Achievement Patterns Across Three Years

The most encouraging data for showing the effectiveness of the Assistant Teacher Program are given in tracing the achievement patterns of the third grade students over a three year span. These data are illustrated in Figures 1 and 2 for the areas of mathematics and reading achievement.

Table 10

Percentage of Third Graders in
Lower Quarter in Achievement

Achievement Areas	Percentage 1984-85	Percentage 1985-86	Changes in Percentages
Word Study Skills	27	20	-7
Reading Comprehenion	33	17	-16
Vocabulary	31	21	-10
Listening Comprehension		16	
Spelling	19	11	-8
Language	12	10	-2
Concepts of Numbers		17	
Math Computation	19	15	-4
Math Applications	27	20	-7
Social Science		18	
Science		18	
Using Information		16	

Graphic Representations of Achievement in Mathematics for
ATP and Non-ATP Students in First, Second and Third Grades

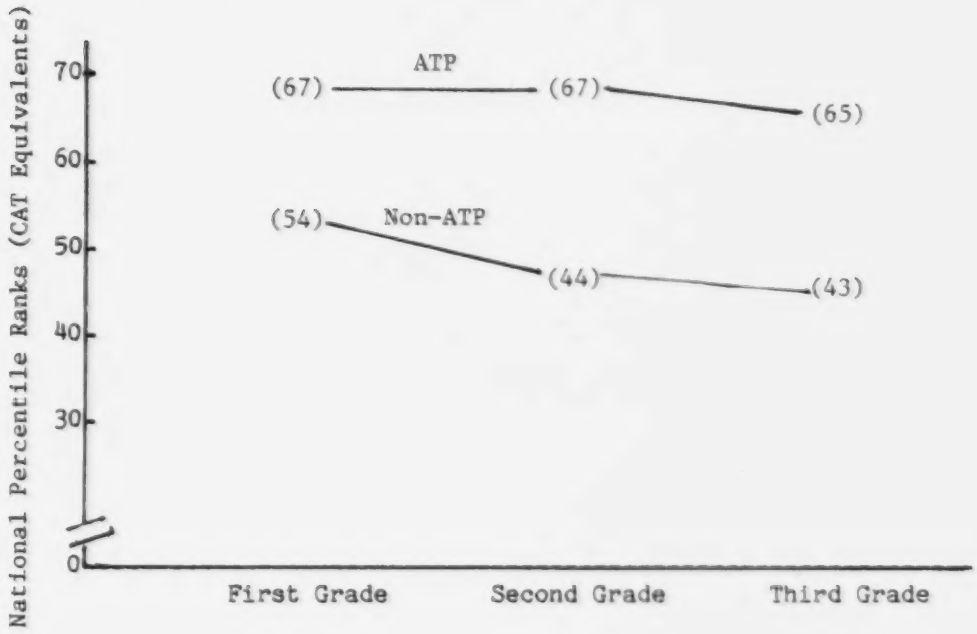

Figure 1

Graphic Representations of Achievement in Reading for
ATP and Non-ATP Students in First, Second and Third Grades

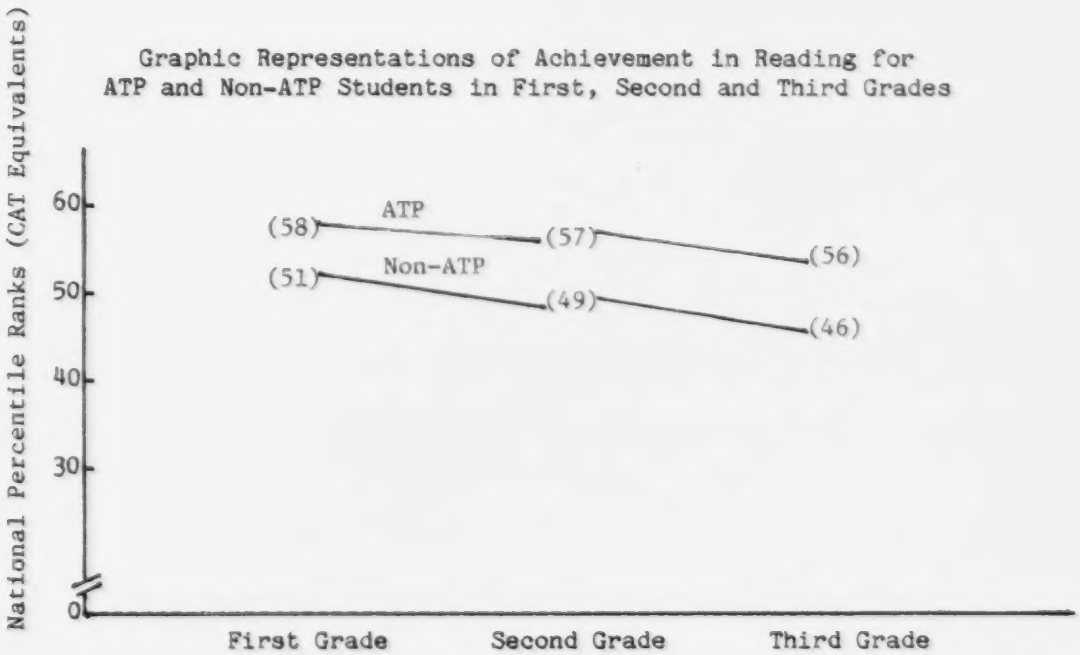

Figure 2

Achievement in Mathematics. As noted on the graphic representation of Achievement in Mathematics for Assistant Teacher and Non-Assistant Teacher taught students in the first three grades on Figure 1, a relatively stable achievement line has been effected for children in mathematics across a three year span. On California Achievement Test Norms, the students averaged 67th percentile in both the first and second grades. The same students in the third grade achieved at the 65th percentile in overall mathematics, showing that a drop of only two percentile ranks had occurred within a three year span in mathematics achievement.

In contrast, the comparison group of children who finished the first three grades without the assistance of the assistant teachers placed at the 54th percentile in first grade, 13 percentile points on the CAT test lower than the ATP group. Then, the non-ATP group dropped to the 44th percentile at the second grade in mathematics achievement and to the 43rd percentile in the third grade. At the end of the third grade the students who had been taught by teacher-teacher assistant teams ranked 22 percentile points higher than did the non-ATP group in achievement in mathematics. The stable achievement pattern in mathematics for the ATP group is significant since in Mississippi a drop in achievement between first and second grades is expected traditionally.

Achievement in Reading. In reading achievement, a similar pattern of progress existed for the third graders across a three year span. Differences in the ATP and non-ATP

groups in reading achievement, however, were not so dramatic as in mathematics. The two groups differed seven percentile points at the end of first grade and 10 pecentile points at the end of third grade. The non-ATP group did not drop sporadically in achievement at the end of second grade, as compared to the children taught after the initiation of assistant teachers.

In summary. Achievement patterns of third grade children over the first primary grades showed that those taught by teacher-assistant teacher teams did significantly better in the areas of total reading and total mathematics at the end of the three grade level. In mathematics, however, a sizeable drop in achievement was observed for the non-APT group at the second grade level, as contrasted with the children working with instructional teams. At the end of third grade the students having ATP instruction ranked 22 percentile points higher in mathematics than did the children taught only by regular teachers. Similarly, the ATP group of third graders scored 10 percentile points higher in reading achievement after completion of three years of study with the teacher-assistant teacher instructional teams.

Summary of Research Findings

The following research findings were noted for first graders in the third year of the program's operation:

1. A general drop in achievement was observed for first

graders in 1985-86, as a whole, as contrasted with achievement for this grade group during the first two years of the Assistant Teacher Program. This drop in achievement was particularly evident in the area of mathematics where the 1985-86 group averaged the 60th percentile in CAT equivalents, as contrasted with the 69th percentile placement on the same area for the 1984-85 group. This drop in achievement for first graders appeared to be associated with the use of the new test battery, the Stanford Achievement Test, for measuring achievement. The Stanford Test, particularly in mathematics, appears to be more difficult than either the California Achievement Test or the California Test of Basal Skills, the two tests used previously to measure achievement of first graders.

2. Though a drop in first grade achievement was evident, the 1985-86 group of first graders was above national average on recent norms (50th percentile) in the areas of word study skills, reading comprehension, listening comprehension, spelling, and total reading achievement. Students, however, placed at lower than the 50th percentile in all areas of achievement in mathematics (total mathematics, math computations and applications and concepts of numbers).

3. The number of students achieving at the upper level of the tests was not as many as expected in all achievement areas studied. In total mathematics achievement, for example, 15% fewer students placed in the upper quarter than did the previous year on the same test.

4. At the same time, too many students placed in the "at risk" level of below the 25th percentile on the Stanford Test, as contrasted with achievement on other tests earlier. Again the major achievement areas in which the lower achieving students did not do so well were associated with mathematics.

Findings relative to the achievement of second graders were more heartening. These findings are summarized as follows:

1. Achievement for this year's second graders was found to be very similar to that of second graders in the previous year. Both of these groups, having studied in the Assistant Teacher Program for two years, did well in achievement compared to national norms, with the groups scoring above the 50th percentile in all areas of achievement measured.

2. The average second grader placed highest in spelling achievement (65th percentile) and lowest in vocabulary (51st percentile). On the new test's norms, achievement in different facets of mathematics ranged from the 60th percentile to the 52nd percentile, and achievement on different tests in reading ranked from the 57th percentile to the 53rd percentile.

3. After studying in the Assistant Teacher Program for two years, the better achievers among the second graders did as well as or better than expected in all areas of achievement, except for listening comprehension. More of the higher achievers did best in math computations, spelling and word reading (application of phonics to word comprehension).

4. Fewer than 25% of all second graders were in the lower quarter of achievement in all areas testing, showing that fewer of the group were in the "at risk" group than was expected according to national norms. As contrasted with second graders of the previous year, this year's second graders working at the lower level appeared to be doing better in mastering word studying skills, reading comprehension skills and concepts related to numbers.

Research findings related to the achievement of third graders, students who completed the three year instructional sequence under teacher-assistant teacher teams, were as follows:

1. As contrasted with third graders in the previous year who had not had the benefits of the Assistant Teacher Program, the 1985-86 third graders scored 22 percentile points higher in achievement in overall mathematics and 10 percentile points higher in overall reading skills. In the critical areas of reading comprehension and math applications, parts of the curriculum in which Mississippi's children had not done so well in the past, the third graders who had finished three years of the Assistant Teacher Program placed 29 and 28 percentile points, respectively, higher than did their counterparts of the previous year.

2. After completion of three grades under the aegis of the ATP, the third graders in Mississippi averaged about the 50th percentile in all areas of achievement tested by the Stanford Achievement Test. They placed highest on the average

in overall language achievement (60th percentile), skills in using information (59th percentile), overall mathematics achievement (57th percentile) and concepts of numbers (56th percentile).

3. Children achieving at both the top and bottom levels in the state appeared to be doing about as well as expected, with somewhat fewer top scoring students than expected in the areas of word study skills, listening comprehension, concepts of numbers and math computations. Data also showed that fewer students existed in the "at risk" category in achievement in several areas than in previous years. The instructional teams appeared to be doing a particularly good job in assisting lower achievers to move out of the "at risk" region in areas of reading comprehension, vocabulary and spelling achievement.

4. Achievement patterns for third graders who have participated in the ATP instruction for three years have remained stable in the areas of overall mathematics and overall reading achievement. In contrast, achievement of their counterparts have ranged significantly lower at each grade level. Specifically, a large drop in achievement was observed for the non-ATP group at the end of second grade. This drop in achievement was not observed for children from the teacher-assistant teacher managed classrooms.

Implications of Study

At the end of its first three years of operation, the Assistant Teacher Program in Mississippi must be pronounced

highly successful in any sense. The achievement data collected for third graders who had worked with teacher-assistant teacher teams for three years best illustrated this accomplishment. The third graders who had benefited from the program placed 22 percentile points on the average higher in achievement in mathematics (overall) than did their counterparts a year ago who had not had assistant teachers in their classrooms. Though the program did not benefit achievement in reading quite so well, showing only a 10 percentile point differential, the importance of the assistant teachers in this area also were very evident.

Furthermore, a stable pattern of achievement ranging above the national average appears in place for the third graders. This same stable pattern of good achievement seemed to be indicated for second graders in the study also. The achievement pattern for first graders, however, seems to be somewhat more uncertain.

First graders, at the end of the first year of the study, had achieved well, as compared to their counterparts who did not take part in the Assistant Teacher Program from earlier years. Their achievement was measured through the use of the California Achievement Test, an instrument used for many previous years in Mississippi to assess achievement. The next year's first graders, however, did not do quite so well as had those of the previous year. Since a different test, the California Test of Basal Skills, was employed to measure achievement, it was thought that drops of achievement for

first graders in the ATP classrooms probably were related to the use of the new, more recently normed test. Then, in this third year of the study, a third test battery was used to collect data, the Stanford Achievement Test battery. First graders in this third year of the study, while still doing better in achievement than did first graders before the initiation of the Assistant Teacher Program, scored lower than they have in the past three years.

The achievement drops for first graders have been intense, far more than expected by the changing in the use of equivalent tests. It is expected that the Stanford Achievement Test battery contains more advanced concepts in the testing of achievement in basal skill areas than are built into the curricula of first grade instructional programs in Mississippi. A serious look needs to be taken at the instructional programs for first graders in Mississippi. If children are expected to have mastery of the concepts measured on the Stanford test, then first graders in this state are not achieving at expected levels in these areas. If the concepts tested by the Stanford Achievement Test are truly more difficult, then next years' first graders, with the support of one year of kindergarten instruction, should do much better on this test than was observed in 1985-86.

It was especially interesting to note that, under ATP instruction, second and third graders had mastered the concepts tested by the Stanford Achievement Test battery at a level considerably higher than national average. Improvements

in the important skill areas of reading comprehension and math concepts and applications were noteworthy. These are the areas of instruction requiring higher order thinking skills of children. Traditionally, children in Mississippi have scored lower in these areas. Apparently the Assistant Teacher Program is providing more instructional time so that these very important skills can be developed more adequately.

As has been noted in two previous reports, any problem in achievement which children in Mississippi are encountering now are probably more related to the need for curriculum changes than to inefficiencies in the Assistant Teacher Program. Younger children in the state need to know more about their environment. They need to be taught better listening skills. Though great progress is being made in these areas, the children still need to work more on reading comprehension and perhaps vocabulary.

At the end of third grade, achievement of the students is highly commendable in mathematics, but something happens to students in mathematics before they reach the eighth grade. At that level, test data show students to be highly deficient in mathematics. That deficiency would not be predicted from observation of third grade data where children are averaging the 65th percentile in mathematics achievement. Implications of such observations needed to be studied as reflected in the curriculum offered children.

Recommendations

The following three recommendations are made concerning the Assistant Teacher Program:

1. The Assistant Teacher Program should be continued as projected in the Educational Reform Legislation. The effects of the program on achievement of children in the fourth grade, after having no assistant teachers for a year should be studied. It is expected that the effects of the program will still be indicated even a year later. This observation was made in the pilot project conducted in Lee County several years ago.

2. It is recommended that careful study be made of the curriculum in first grade to determine why achievement for this group, as measured by the Stanford Achievement Test, dropped so drastically. Such lower achievement patterns were not observed in the second and third grades, though the same test battery was used to gather data at the higher grade levels.

3. It is recommended that the same test battery be used to measure data for the next few years so that achievement gains can be studied more accurately. This series of evaluation studies on data from a three year span has been very difficult to handle because the tests used have been changed three times. Computation of equivalent scores from test to test has probable built-in errors and results can be only estimations at best.